Cover sheet

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CAUCASUS MOUNTAINS

Synonyms: not applicable

Definition: not applicable

Text:

The Caucasus Mountains are aligned west-northwest to east-southeast between 40-44° N and 40-49° E and span the borders of Russia, Georgia, Armenia and Azerbaijan. They consist of two separate mountain systems: the Greater Caucasus extends for ~1,300 km between the Black Sea and Caspian Sea, whilst the Lesser Caucasus runs parallel but approximately 100 km to the south. The Greater Caucasus contains several peaks above 5,000 m, the highest of which is Elbrus at 5,642 m (18,506 ft). The mountains originate from collision between the Arabian plate to the south and the Eurasian plate to the north and the region is tectonically active, with numerous small earthquakes.

In addition to altitudinal variations in climate, the Caucasus Mountains are characterised by strong longitudinal gradients that produce a maritime climate in the west and a more continental climate in the east. Trends in *precipitation*, for example, reveal that westernmost areas typically receive around three to four times as much as eastern areas (Horvath and Field, 1975). The southern slopes are also characterised by higher temperatures and precipitation, which can be up to 3,000-4,000 mm a^{-1} in the southwest (Volodicheva, 2002). Much of this precipitation falls as *snow*, especially on windward slopes of the western Greater Caucasus, which are subjected to moist air masses sourced from the Black Sea. The high *snowfall* and steep slopes (>25º) result in one of the highest levels of *avalanche* activity in the whole of Russia (Seliverstov et al., 2008).

Glaciers cover large parts of the Caucasus, particularly on north-facing slopes of the central Caucasus, with estimates ranging from 1400 km^2 (Bazhev, 1989) to 1,805 km^2 (Horvath and Field, 1975). There are over 2000 glaciers, mainly classed as small, *mountain* or *cirque glaciers*; but the highest summits can be covered by larger *ice fields* drained by several glaciers, e.g. Elbrus, which is covered by a 123 km^2 ice field (Volodicheva, 2002).

The most recent glacier advances are associated with the '*Little Ice Age*' and maximum positions have been dated to AD 1680, 1750 and 1850 (Volodicheva, 2002). Glaciers have subsequently retreated from these positions (probably by as much as 30%) and widespread *terminus* retreat has been documented from 1972 and 2000 (Bedford and Barry, 1995; Stokes et al., 2006). Analysis of the *mass balance* of Djankuat Glacier, one of ten *benchmark glaciers* selected by the *World Glacier Monitoring Service* because of its continued measurement since 1967, indicate that this retreat is being driven by increased summer temperatures, with no compensating increase in winter precipitation (Shahgedanova et al., 2005). Furthermore, glacier retreat appears to be associated with expansion of *supraglacial debris* cover and ice-contact/*proglacial lakes* (Stokes et al., 2007), which may increase the likelihood of glacier-related hazards and debris flows. Unfortunately, such hazards are relatively common in this region and have led to major loss of life. On the 20 September 2002, for example, a catastrophic ice-debris flow, including almost complete mobilisation of the Kolka Glacier, travelled 19 km down the Genaldon Valley, North Ossetia, and killed over 100 people (Evans et al., 2009).

Cross References:

Precipitation

Snow

Snowfall

Avalanche

Mountain glacier

Cirque glacier

Ice field

Little Ice Age

Terminus

Mass balance

Benchmark glacier

World Glacier Monitoring Service

Supraglacial debris

Proglacial lakes

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